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(56) Documents Cited

GB 2171882 A

GB 1444089 A

EP 0438985 A

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US 4908979 A

(58) Field of Search

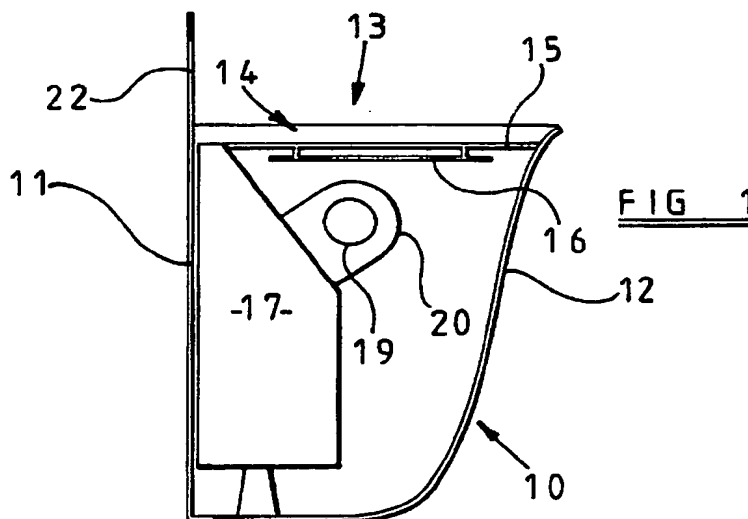
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ONLINE DATABASES: WPI

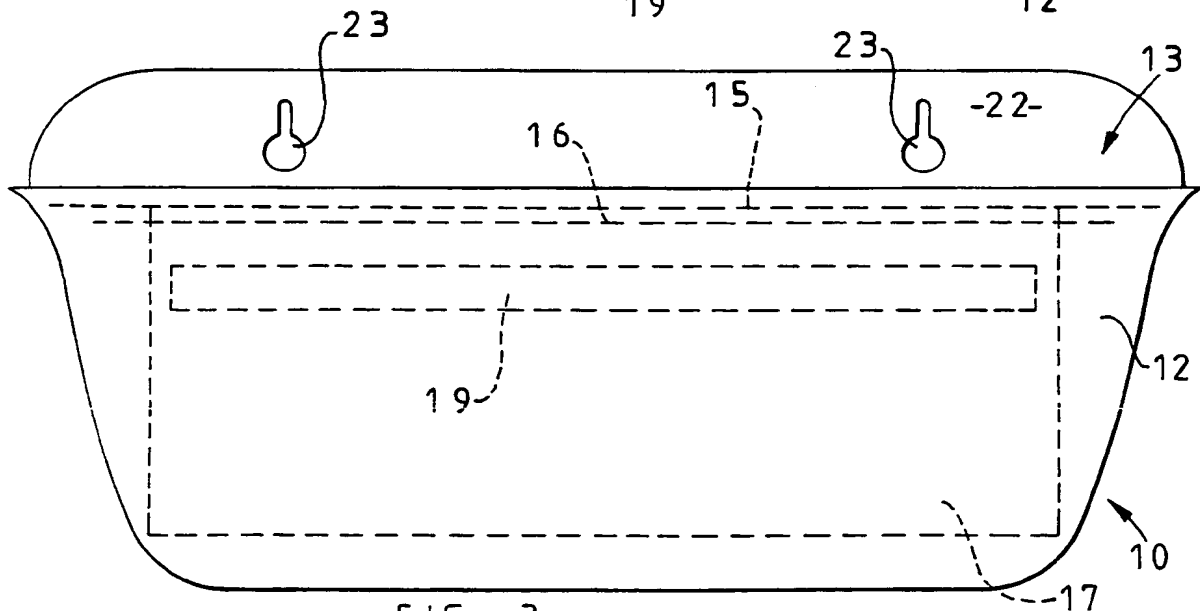
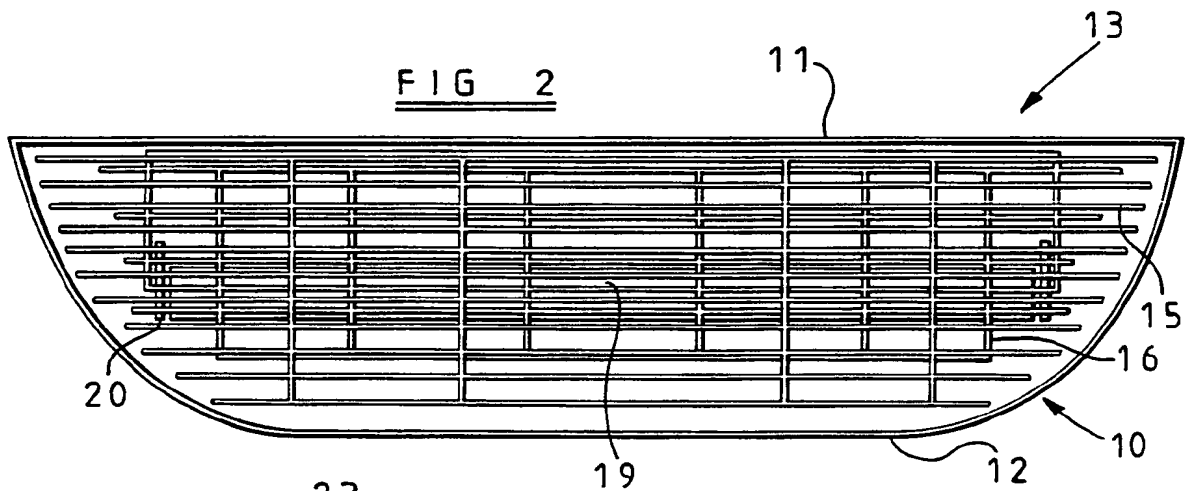
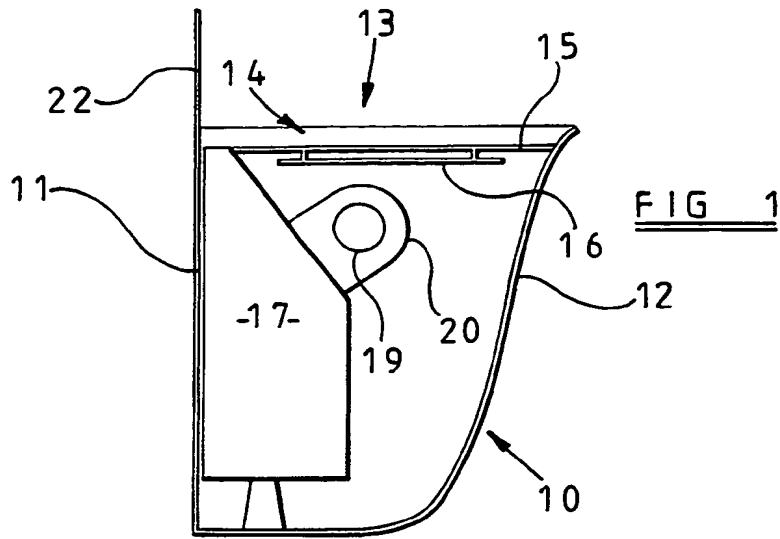
(54) Insect killing apparatus

(57) Insect killing apparatus has a housing 10 with an upwardly directed opening 13. Below the opening is an ultra violet emitter 19 and above the emitter is a charged grid arrangement 14 whereby the insects are attracted towards the emitter and are killed by the grid. The emitter directs ultra violet light upwards and when in use the apparatus can simulate a plant holder.



At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1990.



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FIG 4

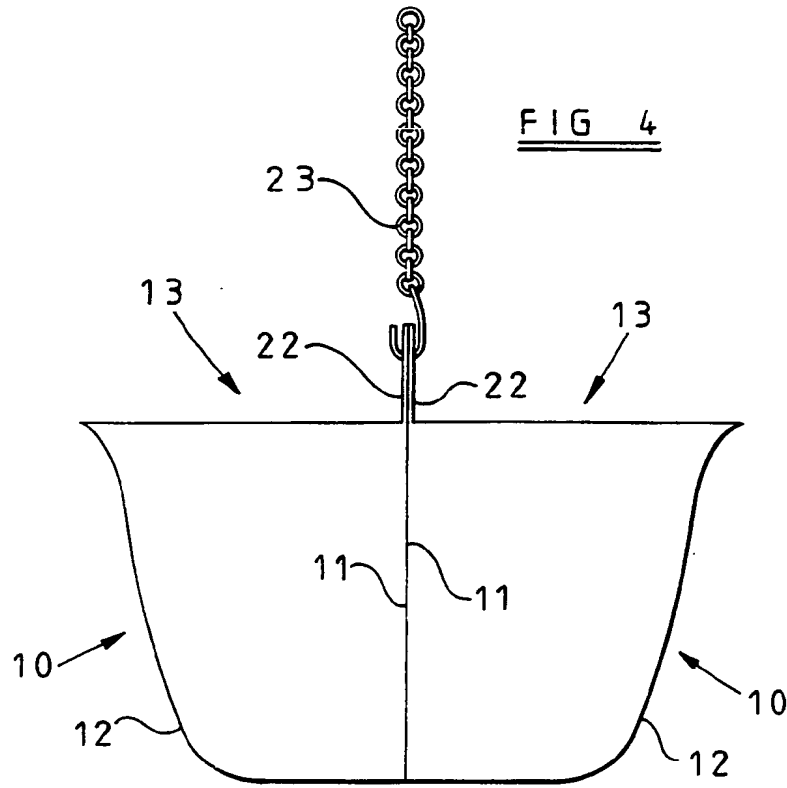
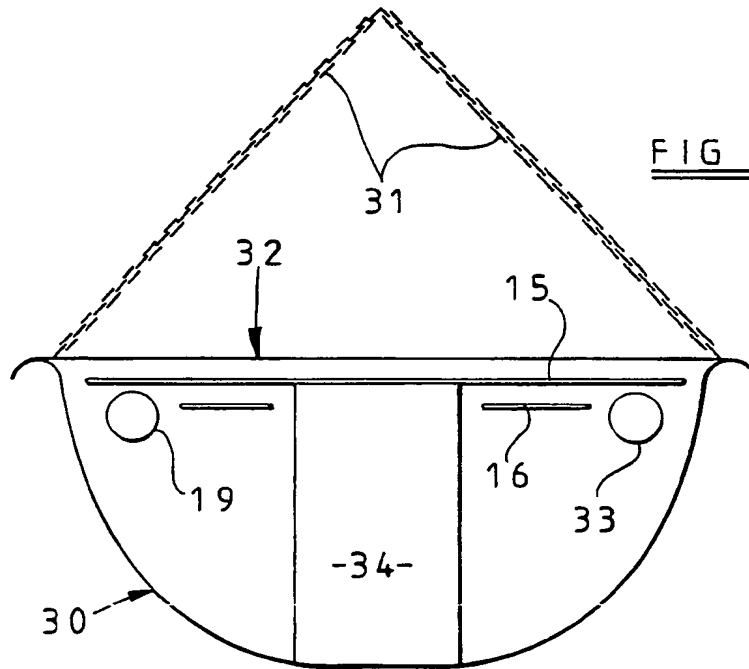


FIG 5



Insect Killing Apparatus

This invention relates to insect killing apparatus and, in particular, to apparatus in which flying insects are attracted by an attractant such as ultra-violet emissions, towards an electrical charge.

Apparatus has been proposed in which insects are attracted by ultra violet emissions towards a grid which is electrically charged, so that the insects are killed. Such apparatus conventionally takes the form of an upright container open at one side through which the emissions are directed and through which the insects enter.

An object of the invention is to provide an improved insect killing apparatus.

According to the invention insect killing apparatus comprises a housing having an opening which in use is directed upwardly, ultra violet emission means located interiorly of the housing and below said opening for emitting ultra violet radiation acting to attract insects towards its source; grid means located above the emission means, adjacent said opening and extending generally horizontally; and electrical supply means within the housing connected to the grid means for electrically charging the grid means whereby insects are killed as they approach the emission means; the housing being presented in use to receive insects towards the base of the housing.

Preferably the housing is provided with mounting means for mounting the housing in an upright position, for example, against an upright wall or in a suspended position.

The housing is conveniently shaped to simulate an article, such as a plant holder, to give a pleasing external appearance, and the housing may be arranged to receive plants in its upper opening without interfering with access for insects to said

opening.

It will be seen that the ultra violet emissions will be directed upwardly from the apparatus, further enhancing the visual appearance of the apparatus in use.

Further features of the invention will appear from the following description of an embodiment of the invention given by way of example only and with reference to the drawings, in which:-

Fig. 1 is a sectional end elevation of a wall mounted apparatus,

Fig. 2 is a plan view of the apparatus of Fig. 1,

Fig. 3 is a side elevation in vertical section of the apparatus of Fig. 1,

Fig. 4 is an end view of one form of suspended apparatus, and

Fig. 5 is a sectional view of another form of suspended apparatus.

Referring to the drawings and firstly to Figs. 1-3 flying insect killing apparatus comprises a housing or container 10 having an upright side wall 11 and a shaped side wall 12 which is of curved shape to define the ends and base of the container. A container 10 has an upper opening 13 which is directed upwards to form a generally horizontal aperture.

Located somewhat below the opening 13 and occupying substantially all the cross section of the opening is formed a horizontal grid structure 14 comprising an upper grid 15 and a lower grid 16, the upper grid 15 being spaced above the lower grid 16 and the lower grid 16 being electrically charged at a high voltage.

The grid structure 14 is supported from an electrical housing 17 fixed to the side wall 11 of the container and supported from the base thereof. In the housing 17 is located an electrical

transformer for supplying power to the grid 16 and an electrical supply for ultra violet emission means, to be described.

Below the grid structure 14 is located a tube 19 which is of the kind which emits ultra violet radiation of a wave length (UVA) which is known to attract insects towards the source and which is powered from the housing 17. The tube 19 lies horizontally extending from end to end of the container 10 and is supported from brackets 20 having electrical contacts in conventional manner. However other shapes of tube may be employed such as U-shaped or circular tubes. However other shapes of tube may be employed such as U-shaped or circular tubes.

The housing 17 lies to one side of the interior space of the container 10 and the tube is located generally centrally across the width of the container so that the container affords access into the container space for insects which have been killed by coming close to or into contact with the grid 16, the insects falling into and being collected in the base of the container. Such insects may be periodically removed from the container either by releasing and inverting the container, or by providing a removable cover (not shown) at the base of the container through which the insects may be discharged without dismounting the container.

As shown in Figs. 1-3 the container is arranged to be mounted, in use, on a vertical surface such as a wall, the container having a side wall extension 22 which extends above the level of the grid structure and is part of the side wall 11. The extension 22 includes openings 23 for fixing the container to the vertical surface.

In the position shown visible blue light from the tube 19 will be directed upwards without the internal grid structure and tubes being readily visible, to give a pleasing effect. This can be further enhanced by the location of artificial plants or plant material, in the container 10 so that such material is presented to give the appearance of a wall mounted planter. The plant

material is conveniently attached to the grid 15 by suitable ties or brackets (not shown).

The apparatus presents an overall pleasing appearance which can be further enhanced by forming the shaped side wall 12 as a decorative wall with, for example, patterns moulded or otherwise formed in said wall which may be of moulded plastics common to and integral with the body of the container 10.

Fig. 4 shows an alternative arrangement in which two of the containers 10 of Figs. 1-3 are arranged as a hanging unit with the side walls 11 arranged in juxtaposition and the combined unit suspended through the openings 23 from a suspension chain or chains 25 or other suspension elements.

Fig. 5 shows a circular container 30 suspended from the outer rim of the container by suspension elements 31 from a ceiling or the like. Within the upper opening of the container is located a grid structure 32, similar but of different shape to the structure 14 of Figs. 1-3, and a circular tube 33 or other tube arrangement from which ultra violet emissions are directed upwardly through the upper opening. The container 30 has a housing 34 for the transformer for the grids and other electrical elements.

Surprisingly the insect killing apparatus of the invention is at least as effective in attracting and disposing of insects as previously proposed apparatus. At the same time the apparatus of the invention provides an enhanced appearance more suited to use in public places such as restaurants and food counters.

Claims

1. Insect killing apparatus comprising a housing having an opening which, in use, is directed upwardly, ultra violet emission means located interiorly of the housing and below said opening for emitting upwardly ultra violet radiation acting to attract insects towards its source, grid means located above the emission means at or below said opening and extending generally horizontally, and electrical supply means operatively connected to the grid means for electrically charging the grid means whereby insects are killed as they approach the emission means, the housing being presented in use to receive killed insects toward the lower end of the housing below the opening.
2. Apparatus according to claim 1 comprising mounting means for mounting the housing in an upright position.
3. Apparatus according to claim 2 wherein the housing is arranged for suspension or against an upright wall surface.
4. Apparatus according to any one of the preceding claims wherein the housing is shaped to simulate an article, such as a plant holder.
5. Apparatus according to claim 4 comprising means at or adjacent said opening for receiving real or artificial plants without interfering with access to the opening for said insects.
6. Apparatus according to any one of the preceding claims wherein the housing is generally trough-shaped and elongate with its opening directed upwardly, and having an upright flat surface along one side, the opposite side surface being curvilinear.
7. Apparatus according to any one of the preceding claims wherein the grid means comprises an upper grid and a lower

grid vertically spaced apart and the lower grid being arranged to be electrically charged.

8. Apparatus according to any one of the preceding claims wherein the housing has at its lower end a removable cover for discharging insects collected therein.

9. Apparatus according to claims 1 or 2 wherein the housing is of circular cross-section in plan view.

10. An insect killing apparatus substantially as described with reference to Figs. 1-3, Fig. 4 or Fig. 5 of the drawings.

Patents Act 1977
Examiner's report to the Comptroller under Section 17
(The Search report)

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Relevant Technical Fields

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(ii) Int Cl (Ed.5) A01M 1/00, /02, /04, /22

Search Examiner
MR R D CAVILL

Date of completion of Search
31 OCTOBER 1994

Databases (see below)

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

Documents considered relevant following a search in respect of Claims :-
1 TO 10

(ii) ONLINE DATABASES : WPI

Categories of documents

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| <p>X: Document indicating lack of novelty or of inventive step.</p> <p>Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.</p> <p>A: Document indicating technological background and/or state of the art.</p> | <p>P: Document published on or after the declared priority date but before the filing date of the present application.</p> <p>E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.</p> <p>&: Member of the same patent family; corresponding document.</p> |
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Category	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2171882 A (BIRCH) - see whole document	1 and 7
X	GB 1444089 (PLESSEY) - see whole document	1, 7 and 8
X	EP 0438985 A1 (MO-EL) - see Figure 1	1
X	WO 79/00574 A1 (REDEC) - see Figures 1 and 2	1
X	US 4908979 (HOSTETTER) - see whole document	1, 2, 7 and 9

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).